

Arthropathies (FIHOA), quality of life evaluated by the SF12, psychological impact of disease by the Hamilton Anxiety Depression scale (HAD), and the number of radiologically affected joints. **Statistics:** mean [standard deviation (sd)]; Kruskal test for univariate analysis of correlations and multiple regression analysis.

**Results:** 101 patients were studied: 90% women (93% menopausal), 10% men, mean age 63.8 (8.7), BMI 23.4 (3.4), 63% with a familial history of HOA, mean symptoms duration 10 (7.5) years. Aesthetic damage scored 43.2 (37.7) mm. It was scored 11.6 (25.6) by men and 46.9 (37.2) by women. Univariate analysis identified the following possible clinically correlated parameters: gender ( $p=0.002$ ); the number of painful joints on pressure (Spearman  $r: 0.30$ ;  $p=0.007$ ); n. of radiologically affected joints ( $r: 0.26$ ;  $p=0.01$ ); n. of spontaneously painful joints ( $r: 0.23$ ;  $p=0.05$ ); and a trend for the n. of nodal joints ( $r: 0.18$ ;  $p=0.08$ ). No correlation was found for pain at rest or on activity, FIHOA, SF12, HAD. Results of the multivariate analysis are in the table.

Table: Aesthetic damage assessment in hand OA: results of the multivariate analysis

Variable	Estimation (standard error)	[95% CI]	P
N. of painful joints on pressure	4.9 (2.0)	[1.0; 8.8]	<b>0.01</b>
Sex	31.9 (14.5)	[3.5; 60.3]	<b>0.03</b>
N. of affected joints on X-rays	0.7 (1.3)	[-1.8; 3.2]	0.60
N. of painful joints	4.2 (3.1)	[-1.8; 10.3]	0.17
N. of nodal joints	-1.4 (2.0)	[-5.2; 2.5]	0.49
FIHOA	0.5 (0.9)	[-1.2; 2.3]	0.56
HAD depression	1.2 (1.6)	[-2.0; 4.3]	0.47

**Conclusions:** This study highlights for the first time that aesthetic damage is a major concern for HOA patients. Aesthetic damage was independent from pain VAS and functional impairment but significantly correlated with female gender and surprisingly the number of painful joints on pressure. Interestingly no association was found with depression.

This issue should deserve more attention and a specific tool exploring aesthetic damage in hand OA and its dimensions should be developed.

## 295 ISOKINETIC TORQUE AND FUNCTIONAL CAPACITY IN WOMEN WITH AND WITHOUT OSTEOARTHRITIS OF THE KNEE

V. Bayrakci Tunay, G. Baltaci, I. Duzgun, D. Ozer. *Hacettepe University, Ankara, TURKEY*

**Purpose:** Osteoarthritis (OA) of the knee causes pain and loss of joint mobility which leads to restriction in physical functioning: patients can no longer walk as far or fast. The purpose of this study was to compare the isokinetic strength measurements of the quadriceps and hamstring and functional outcomes in patients with knee osteoarthritis (OA) and healthy subjects.

**Methods:** A total of 159 volunteer subjects, 60 patients (mean age:  $52.31 \pm 8.73$  years) with bilateral knee OA and 99 age-matched ( $50.79 \pm 7.77$  years) healthy subjects participated in the study. Isokinetic peak torque (PT) measurements of the knee extensors and flexors at  $180^\circ/\text{sec}$  (ISOMED 2000), timed performance test (timed up&go) (TUG) for functional capacity, and body composition analyse (TANITA) for body weight, body mass index (BMI) and fat percent were used.

**Results:** The healthy subjects demonstrated greater differences in flexor isokinetic torques and TUG test results than the OA group (right knee flexor PT;  $t=-5.05$ ,  $p=0.0$ , left knee flexor PT;  $t=-6.5$ ,  $p=0.0$ , TUG test;  $t=6.01$ ,  $p=0.0$ ). Participants in both groups demonstrated similar results and no significance in extensor PT values of the knees (right knee extensor PT;  $t=-1.05$ ,  $p=0.29$ , left knee extensor PT;  $t=-1.05$ ,  $p=0.29$ ). In body composition analyse healthy subjects' body weights and BMI found greater than the OA group (body weight:  $t=-2.12$ ,  $p=0.035$ , BMI:  $t=-3.55$ ,  $p=0.001$ ).

**Conclusions:** Quadriceps muscle strength and weight differences may not be the most important indicators in the knee OA. To improve agonist-antagonist muscle balance of the quadriceps and hamstring muscle may be the most important than focused on only strengthening the quadriceps muscle in rehabilitation.

## 296 HOW CLINICAL OUTCOMES MAY BE INFLUENCED BY THE NUMBER OF AFFECTED JOINTS IN HAND OA (HOA)?

E. Maheu, M. Michon, F. Carrat, F. Berenbaum. *St Antoine Hospital, Paris, FRANCE*

**Purpose: Objectives:** To look at the relationship between the number of clinically or radiologically affected joints and clinical parameters in HOA.

**Methods:** Prospective cross-sectional study. Successive outpatients visiting at the Hand OA clinic of St-Antoine hospital were examined according to a standardized case report form. Postero-anterior X-rays of both hands on a single film were performed. Data collected: demographics, personal/familial medical history, HOA history, clinical and radiological description, including nodes, pain at rest and on move (VAS), pain on joint pressure, patient's global disease assessment, aesthetic damage scored by patients on a 0–100 mm VAS, function (Functional Index for Hand Arthropathies (FIHOA)), quality of life (SF12), psychological impact of HOA (Hamilton Anxiety Depression (HAD) scale) and the number of affected joints on X-rays. **Statistics:** %, mean [standard deviation (sd)]; Spearman correlation coefficient was used to assess correlations.

**Results:** 101 patients were studied: 90% women (93% on menopause), 10% men, mean age 63.8 (8.7), BMI 23.4 (3.4), 63% with a familial history of HOA, mean symptoms duration 10 (7.5) years. Mean scores were 48.3 (25.4) mm for pain during activity, 43.2 (37.7) mm for aesthetic damage, 41.4 (27.7) mm for patients global assessment, 8.2 (6.0) for FIHOA [0–30], 6.6 (3.3) for HAD scale [0–21], 44.7 (7.2) for SF12 [0–100].

Results of the correlations between the numbers of affected joints and clinical outcomes are in the table.

Table. Correlations between the number of HOA joints affected and clinical outcomes

Variable $r$ ; $P$	N of spontaneous painful joints	N of painful joints on pressure	N nodal joints	N radiologically affected joints
Pain at rest	0.07; 0.53	0.22; 0.06	0.01; 0.90	0.05; 0.63
Pain on activity	0.05; 0.66	0.33; <b>0.003</b>	0.05; 0.60	0.22; <b>0.04</b>
Aesthetic damage	0.23; <b>0.05</b>	0.30; <b>0.007</b>	0.18; 0.08	0.26; <b>0.01</b>
Patients global	-0.03; 0.80	0.38; <b>0.001</b>	-0.07; 0.52	0.18; 0.09
FIHOA	0.17; 0.16	0.30; <b>0.01</b>	0.04; 0.72	0.17; 0.11
SF12 MCS	0.04; 0.77	-0.14; 0.22	0.02; 0.83	0.06; 0.59
SF12 PCS	-0.17; 0.17	-0.28; <b>0.02</b>	0.03; 0.79	-0.13; 0.25
SF12 total	-0.09; 0.46	-0.23; <b>0.05</b>	0.008; 0.93	-0.06; 0.58
HAD depression	-0.08; 0.50	0.13; 0.28	0.03; 0.78	0.08; 0.44
HAD anxiety	0.11; 0.34	0.21; 0.07	0.08; 0.43	0.15; 0.16
HAD total	0.01; 0.93	0.17; 0.13	0.05; 0.61	0.13; 0.21

In addition, no correlation between night awakening and the number of affected joints was observed. Conversely, morning stiffness was significantly correlated to the number of painful joints ( $p=0.05$ ), the number of nodal joints ( $p=0.01$ ) and the number of affected joints on X-rays ( $p=0.006$ ).

**Conclusions:** The number of radiologically affected joints is correlated to pain on activity, aesthetic damage and morning stiffness in HOA patients. Moreover, the number of painful joints on pressure is significantly associated with a higher score of all clinical parameters but morning stiffness.

## 297 TREATMENT WITH HYLAN G-F 20 AND CORTICOSTEROID: EXPECTATIONS OF TREATMENT AND OUTCOMES SIX MONTHS FOLLOWING TREATMENT

K.K. Briggs, J. Steadman, L.M. Matheny. *Steadman Hawkins Research Foundation, Vail, CO, USA*

**Purpose:** The purpose of this study was to determine patients' expectation of treatment and document outcomes following treatment protocol in which corticosteroid is used, in addition to initial Synvisc injection 3 series.

**Methods:** 63 patients were enrolled in a prospective cohort study, IRB approved with informed patient consent. Inclusion criteria were patients aged 18–80 years with knee osteoarthritis diagnosis based on radiographic examination (Kellgren-Lawrence). Patients with prior synovectomy on injection knee were excluded, as well as if they had rheumatoid disease, any serious systemic disease, acute synovitis, excessive effusion, allergy to avian products/hyaluronan-based injection components/corticosteroid injection, pregnant, previous arthroscopic surgery within last 6 months or joint infection within previous 3 months. Patients were given standard course of 3 (2 ml) weekly injections. At first injection, in addition to Hylan G-F 20, corticosteroid was added, but not in second and third. At 3, 6 and 12 weeks and 6 months following injection series completion, patients completed a form with WOMAC score. Patients

completed SF-12 at preinjection and 6 months and an expectations questionnaire prior to surgery. 20 patient expectation domains were measured and analyzed individually, as "very important" to "of little to no importance".

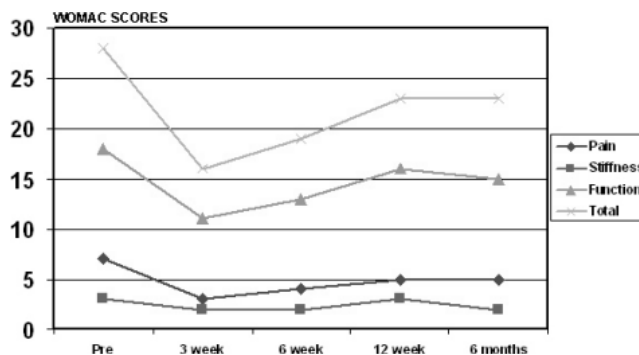
17 patients dropped out due to non-medical reasons. Of 46 remaining, 27 were female, 18 male. Average age was 65 (range 42–81). 30 patients (65%) reported previous knee surgery.

**Results:** All patients reported pain as reason for seeking medical treatment. Pain relief was very important to only 66% of patients and somewhat important to 12%. If patients expected pain relief, 43% expected most pain to be relieved. 36% expected all pain to be relieved. 17 (37%) reported stiffness as primary reason for seeking medical treatment. Only 54% of patients expected knee stiffness/swelling to stop. Improving ability to walk was considered very important in 89% and they expected to walk more than 1 mile. 80% of patients considered return to recreational sports an important expectation and somewhat important in 13%. The most important expectation in this group was to have confidence in their knee, avoid future knee degeneration and improve ability to maintain general health. All patients rated these important. Getting knee back to where it was before problem started was only important in 66% of patients.

No patient discontinued injection series due to negative response to injection. 3 (7%) required surgery prior to 6 month time-point. All 3 had previous knee surgery. Average age of failures was 68 (range 66–70). In the 43 patients, results showed positive response in initial weeks following completion of injection series (Figure). Patients at 6 months showed significant improvement in pain, WOMAC score, Lysholm and SF-12 physical component.

	Pre-injection	6 months	p-value
Lysholm	40	62	0.001
WOMAC Pain	7	5	0.004
WOMAC Total	28	23	0.047
SF-12 PCS	41	45	0.015
SF-12 MCS	57	58	0.795

**Conclusions:** In these patients, regaining function was the most important expectation for injection treatment. Improving ability to walk and returning to recreational activity showed to be more important to patients than reducing symptoms. Although patients had higher expectations for improvement in knee function, Hyland G-F 20 with corticosteroid, showed to significantly improve function, and significantly decrease pain. Hyland G-F 20 and corticosteroid may be a good treatment option for older patients suffering from osteoarthritis, who desire to return to an active lifestyle.



## 298 IMPROVING THE SAFETY AND EFFECTIVENESS OF INTRA-ARTICULAR PROCEDURES: A RANDOMIZED CONTROLLED TRIAL OF THE RECIPROCATING PROCEDURE DEVICE

**P.A. Band<sup>1</sup>**, W.L. Sibbitt Jr.<sup>2</sup>, A.A. Michael<sup>2</sup>, R.R. Sibbitt<sup>3</sup>, A.D. Bankhurst<sup>2</sup>. <sup>1</sup>New York University School of Medicine, New York, NY, USA, <sup>2</sup>University of New Mexico Health Sciences Center, Albuquerque, NM, USA, <sup>3</sup>St Peters Hospital, Helena, MT, USA

**Purpose:** The potential for intra-articular treatments to improve the medical management of osteoarthritis (OA) continues to receive increasing attention, particularly for patients in whom one or two problem joints drive their disability. To improve the procedure for administering intra-articular

therapies, a new syringe-like device was specifically designed for musculoskeletal aspiration/injection procedures. Termed the Reciprocating Procedure Device (RPD), this device enables significantly more precise control of needle position, reduces procedure pain and trauma, increases the volume of synovial fluid that can be collected, and decreases the time for performing intra-articular procedures (Arthritis & Rheumatism, in press). These attributes are important for both therapy and biomarker analysis. Corticosteroid and hyaluronan are the agents most commonly administered by intra-articular injection, both of which require precise delivery of the agent to the anatomical intra-articular space. In this trial we hypothesized that the outcome of local therapy for OA was dependent on the needle placement and needle control characteristics of the device used for arthrocentesis and injection.

**Methods:** One hundred patients with symptomatic OA in a single large joint were enrolled in an IRB-approved protocol, registered at clinicaltrials.gov. Patients were randomized to have arthrocentesis and intra-articular corticosteroid injection performed using either the RPD or a conventional syringe. The primary outcome measure was pain in the affected joint, measured (1) at baseline (prior to the procedure), (2) during local anesthesia, (3) during the arthrocentesis/injection procedure itself, (4) at 2 weeks post-procedure, and (5) at 6 months post-procedure. Pain was measured using a Visual Analogue Pain Scale (VAPS) (0 = no pain, 10 = most severe pain) with significant pain being defined as a VAPS score >5.

**Results:** The group randomized to the RPD experienced significantly reduced pain scores during both local anesthesia administration (Syringe:  $6.75 \pm 2.51$ ; RPD:  $3.63 \pm 1.98$ ,  $p < 0.001$ ), and during the arthrocentesis/injection procedure (Syringe:  $4.25 \pm 2.51$ ; RPD:  $2.54 \pm 1.98$ ,  $p < 0.001$ ). With respect to longer term treatment outcomes, the RPD was significantly more effective than the conventional syringe in reducing pain scores at 2 weeks (Syringe:  $3.27 \pm 3.41$ ; RPD:  $1.89 \pm 0.98$ ,  $p < 0.001$ ), the time point at which corticosteroid injections are expected to exhibit their greatest efficacy. Pain scores at 6 months trended toward improved effectiveness for the RPD group (Syringe:  $6.67 \pm 2.41$ ; RPD:  $4.89 \pm 2.98$ ,  $p = 0.06$ ).

**Conclusions:** Though both groups experience the therapeutic benefit expected from intra-articular corticosteroid injection, this study demonstrates that the device used to administer intra-articular therapy can influence the safety and effectiveness of the procedure itself. Moreover, the data demonstrate that the RPD significantly improves patient outcomes at two weeks post-injection, and suggests the potential for improved therapeutic outcomes at six months. Considering the growing importance of office-based intra-articular procedures to OA treatment, the utility of the RPD to substantially improve patient safety, comfort and outcomes should be confirmed in additional studies.

## 299 KNEE INJURY AND OSTEOARTHRITIS OUTCOME SCORE (KOOS) AND CARTILAGE BIOMARKERS IN MIDDLE-AGED WOMEN WITH EARLY OSTEOARTHRITIS (OA)

**A.E. TAMM<sup>1</sup>**, J. Kumm<sup>1</sup>, M. Lintrop<sup>1</sup>, B-C. Sondergaard<sup>2</sup>, A.O. Tamm<sup>1</sup>. <sup>1</sup>University of Tartu, Tartu, ESTONIA, <sup>2</sup>Nordic Bioscience Diagnostics, Harlev, DENMARK

**Purpose:** In comparison with WOMAC, the novel self-reported quantitative index Knee Injury and Osteoarthritis Outcome Score (KOOS) has two new subscales Sport/Recreation (SP/Rec) and Quality of Life (QL). Recently the short form KOOS-PS was published (Perruccio *et al* 2008) which focuses on some components of SP/Rec. There is evidence that intensive turnover of collagen type II takes place in early OA.

**Aim:** To investigate the associations of the functional limitations expressed by KOOS with emphasis on the SP/Rec subscale with (i) radiographic features of early KOA, (ii) degradation of type II collagen and (iii) low-level inflammation in middle-aged women at baseline and at 3 years.

**Methods:** A subset of women, including 100 subjects aged 34–54 years (mean 45) at baseline, from a representative symptomatic cohort of Elva, South-Estonia, was followed up. BMI >26 was observed in 66% of the women.

**KOOS:** The KOOS questionnaire includes the following subscales: Symptoms (S), Pain (P), Activities of daily life (ADL), Sport/recreation (SP/Rec) and Quality of life (QL). An index value was calculated for every subscale (0–100; better functional status is expressed by higher index value).

**Radiographs:** Antero-posterior weight-bearing radiographs of the tibio-femoral compartment (TF) and axial radiographs of the patello-femoral (PF) compartment of the knee joint were assessed.